

# **Virginia**

**Standards of Learning Assessments**

**Test Blueprint**

**Algebra I**

**2016 Mathematics  
Standards of Learning**

**This revised test blueprint will be effective with the  
administration of the 2018-2019 Mathematics Standards of  
Learning (SOL) tests.**

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# **Algebra I Standards of Learning**

## **Test Blueprint**

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## **General Test Information**

### **Test Blueprint**

Much like the blueprint for a building, a test blueprint serves as a guide for test construction. The blueprint indicates the content areas that will be addressed by the test and the number of items that will be included by content area and for the test as a whole. There is a blueprint for each test (e.g., grade 3 reading, grade 5 mathematics, grade 8 science, Virginia and United States History).

### **Reporting Categories**

Each test covers a number of Standards of Learning (SOL). In the test blueprint, the SOL are grouped into categories that address related content and skills. These categories are labeled as reporting categories. For example, a reporting category for the Algebra I Standards of Learning test is *Equations and Inequalities*. Each of the SOL in this reporting category addresses the solution or application of equations or inequalities. When the results of the SOL tests are reported, the scores will be presented for each reporting category and as a total test score.

### **Assignment of Standards of Learning to Reporting Category**

In the Algebra I SOL test, each SOL is assigned to only one reporting category. For example, SOL A.2a-c is assigned to “Expressions and Operations.”

### **Coverage of Standards of Learning**

Due to the large number of SOL in each grade level content area, *every* Standard of Learning will not be assessed on every version (form) of an SOL test. By necessity, to keep the length of a test reasonable, each version will sample from the SOL within a reporting category. Every SOL in the blueprint will be tested within a three year period, and *all of these* SOL are eligible for inclusion on each version of an SOL test.

### **Use of the Curriculum Framework**

The Algebra I Standards of Learning, amplified by the Curriculum Framework, define the essential understandings, knowledge, and skills that are measured by the Standards of Learning tests. The Curriculum Framework asks essential questions, identifies essential understandings, defines essential content knowledge, and describes essential skills students need to master.

## Algebra I Test Blueprint Summary Table

Reporting Category	Algebra I SOL	Number of Items
Expressions and Operations	A.1a-b A.2a-c A.3a-c	11
Equations and Inequalities	A.4a-e A.5a-d A.6a-c	18
Functions and Statistics	A.7a-f A.8 A.9	16
Number of Operational Items		45
Number of Field-Test Items*		10
Total Number of Items on Test		55

\*Field-test items are being tried out with students for potential use on subsequent tests and will not be used to compute students' scores on the test.

## **Algebra I**

### **Expanded Test Blueprint**

#### **Reporting Category: Expressions and Operations**

**Number of Items: 11**

##### **Standards of Learning:**

- A.1 The student will
  - a) represent verbal quantitative situations algebraically; and
  - b) evaluate algebraic expressions for given replacement values of the variables.
- A.2 The student will perform operations on polynomials, including
  - a) applying the laws of exponents to perform operations on expressions;
  - b) adding, subtracting, multiplying, and dividing polynomials; and
  - c) factoring completely first- and second-degree binomials and trinomials in one variable.
- A.3 The student will simplify
  - a) square roots of whole numbers and monomial algebraic expressions;
  - b) cube roots of integers; and
  - c) numerical expressions containing square or cube roots.

#### **Reporting Category: Equations and Inequalities**

**Number of Items: 18**

##### **Standards of Learning:**

- A.4 The student will solve
  - a) multistep linear equations in one variable algebraically;
  - b) quadratic equations in one variable algebraically;
  - c) literal equations for a specified variable;
  - d) systems of two linear equations in two variables algebraically and graphically; and
  - e) practical problems involving equations and systems of equations.
- A.5 The student will
  - a) solve multistep linear inequalities in one variable algebraically and represent the solution graphically;
  - b) represent the solution of linear inequalities in two variables graphically;
  - c) solve practical problems involving inequalities; and
  - d) represent the solution to a system of inequalities graphically.
- A.6 The student will
  - a) determine the slope of a line when given an equation of the line, the graph of the line, or two points on the line;

- b) write the equation of a line when given the graph of the line, two points on the line, or the slope and a point on the line; and
- c) graph linear equations in two variables.

**Reporting Category: Functions and Statistics**

**Number of Items: 16**

**Standards of Learning:**

- A.7      The student will investigate and analyze linear and quadratic function families and their characteristics both algebraically and graphically, including
  - a) determining whether a relation is a function;
  - b) domain and range;
  - c) zeros;
  - d) intercepts;
  - e) values of a function for elements in its domain; and
  - f) connections between and among multiple representations of functions using verbal descriptions, tables, equations, and graphs.
- A.8      The student, given a data set or practical situation, will analyze a relation to determine whether a direct or inverse variation exists, and represent a direct variation algebraically and graphically and an inverse variation algebraically.
- A.9      The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve practical problems, using mathematical models of linear and quadratic functions.